REMARKS

Claims 1 to 30 are pending in the application, of which claims 1, 9, 11, 18, 20, 27 and 29 are the independent claims. Favorable reconsideration and further examination are respectfully requested.

The drawings remain objected to for failing to label Fig. 11 as prior art. Applicants respectfully traverse this objection. As previously noted, Fig. 11 shows a computer system programmed with an embodiment of the invention. Therefore, although the hardware shown may constitute prior art, the system as programmed (as shown) is not prior art. That is, computer instructions 1190, which are one embodiment of the present invention, do not constitute prior art. If Applicants were to label Fig. 11 as prior art, it might constitute an admission that their invention is in the prior art, which is certainly not the case.

For at least the foregoing reasons, withdrawal of the objection to the drawings is respectfully requested.

Claims 1 to 30 were rejected under 35 U.S.C. §102(b) over U.S. Patent No. 5,701,404 (Stevens). As shown above, Applicants have amended the claims to define the invention with even greater clarity. In view of these clarifications, reconsideration and withdrawal of the art rejection are respectfully requested.

Amended independent claim 1 defines method of trimming a parametric surface, which includes producing a trimming texture by applying a trimming curve to a mesh and applying the a trimming texture based on a trimming curve to the parametric surface, the trimming texture being applied by texture mapping the trimming texture onto the

parametric surface. The applied art is not understood to disclose or to suggest these features, particularly with respect to applying a trimming curve to a mesh to produce a trimming texture and texture mapping the trimming texture onto a parametric surface.

As previously stated, Stevens describes a trimming process in which vectors from selected points of a trimming curve are projected onto a surface (see, e.g., Figs. 3A, 4 and 5 of Stevens). The resulting projections are then connected to produce a trimming curve on the surface (see, e.g., Fig. 15B of Stevens). Thus, in Stevens, the trimming curves are applied directly to the surface being trimmed (see, e.g., Fig. 4 of Stevens), whereafter the surfaces being trimmed are rendered. By contrast, in the invention of claim 1, the trimming curves are applied first to a mesh to produce a trimming texture, then the trimming texture (not the trimming curves) is applied to the parametric surface being trimmed. This difference is significant, since texture mapping in accordance with claim 1 can result in less processing during rendering than applying the trimming curves directly to the trimmed surface (see pages 5 and 6 of the application).

It was said on page 5 of the Office Action that Stevens discloses a U,V domain, which the Office Action indicates is evidence of texture mapping. The Office Action cites Computer Graphics: Principles and Practice by Foley, et al. ("Foley") as evidence of this, since Foley talks about the U,V domain and texture mapping. The U,V domain is simply another coordinate space as explained, for example, in the attached article: http://positron.cs.berkeley.edu/~gwlarson/pixformat/cieluvf1.html. The reference to the U,V domain in Foley in no way implies texture mapping. Accordingly, Applicants submit that texture mapping is not inherently disclosed in Stevens.

It was further said on page 5 of the Office Action that "Stevens discloses a U,V domain, i.e., texture coordinate space, and thus making it inherent that the trimming portion would constitute a trimming texture". Assuming, for the sake of argument, that this sentence is true (a point that Applicants do not concede), then the Stevens patent would disclose only obtaining a trimming texture. The Stevens patent would not include the remainder of claim 1, which is to apply the trimming texture to the parametric surface by texture mapping. Thus, even under the Examiner's own interpretation, Stevens is deficient vis-à-vis the foregoing features of claim 1.

For at least the foregoing reasons, Applicants respectfully submit that claim 1 is patentable over Stevens.

Amended independent claim 11 is an article of manufacture claim that roughly corresponds to claim 1; and amended independent claim 20 is an apparatus claim that roughly corresponds to claim 1. These claims are also believed to be patentable for at least the reasons set forth above with respect to claim 1.

Amended independent claim 9 defines a method of trimming a parametric surface, which includes producing a trimming texture by applying a trimming curve to a mesh, mapping the trimming texture on the parametric surface to create a trimmed section and a rendered section, the trimming texture being mapped by texture mapping, and rendering the parametric surface based on an application of the trimming texture to a plurality of polygons approximating the parametric surface.

As explained above with respect to claim 1, Stevens is not understood to disclose or to suggest producing a trimming texture by applying a trimming curve to a mesh and

mapping the a trimming texture on the parametric surface. Accordingly, claim 9 is also believed to be patentable over the art.

Amended independent claim 18 is an article of manufacture claim that roughly corresponds to claim 9; and amended independent claim 27 is an apparatus claim that roughly corresponds to claim 9. These claims are also believed to be patentable for at least the reasons set forth above with respect to claim 9.

Amended independent claim 29 defines a method for use in rendering images from data for an original three-dimensional model. The method includes obtaining a trimming texture by applying a trimming curve to a mesh that defines at least a portion of the three-dimensional model, applying the trimming texture to the three-dimensional model, the trimming texture being applied by texture mapping the trimming texture onto the parametric surface, and rendering an image based on the three-dimensional model.

The Stevens patent does not describe both obtaining a trimming texture by applying a trimming curve to a mesh that defines at least a portion of the three-dimensional model, and applying the trimming texture to the three-dimensional model. Accordingly, claim 29 is believed to be patentable over the art.

In view of the foregoing amendments and remarks, the entire application is believed to be in condition for allowance, and such action is respectfully requested at the Examiner's earliest convenience. In the event that the foregoing amendments and remarks are not deemed to be persuasive, the undersigned respectfully requests a telephone interview with the Examiner to be held at a mutually convenient time.

Applicants' undersigned attorney can be reached at the address shown below.

Telephone calls regarding this application should be directed to the undersigned at 617-521-7896.

CIE Luv Color

The CIE Luv color space is designed to be perceptually uniform, meaning that a given change in value corresponds roughly to the same perceptual difference over any part of the space. Using such a space for quantizing color values decreases the chance that any given step in color value will be noticeable on a display or hardcopy. The Luv space was designed specifically for emissive colors, which correspond to images captured by a camera or computer graphics rendering program. However, we must modify the assumptions used by the CIE slightly, since we want to record high dynamic-range images independent of viewer adaptation. We therefore ignore the part about luminance scale, using instead a log scale to cover a much larger range of values. We also ignore the part about dominant color and encode based on the absolute (u',v') coordinates.

Conversion to and from CIE (u',v') is accomplished with the following transformation:

$u' = 4*x / (-2*x + 12*y + 3)$
$v' = 9*y / (-2*x + 12*y + 3)$

$x = 9*u' / (6*u' - 16*v' + 12)$
$y = 4*v' / (6*u' - 16*v' + 12)$

CIE (x,y) coordinates plus luminance (Y) may then be converted to XYZ values using:

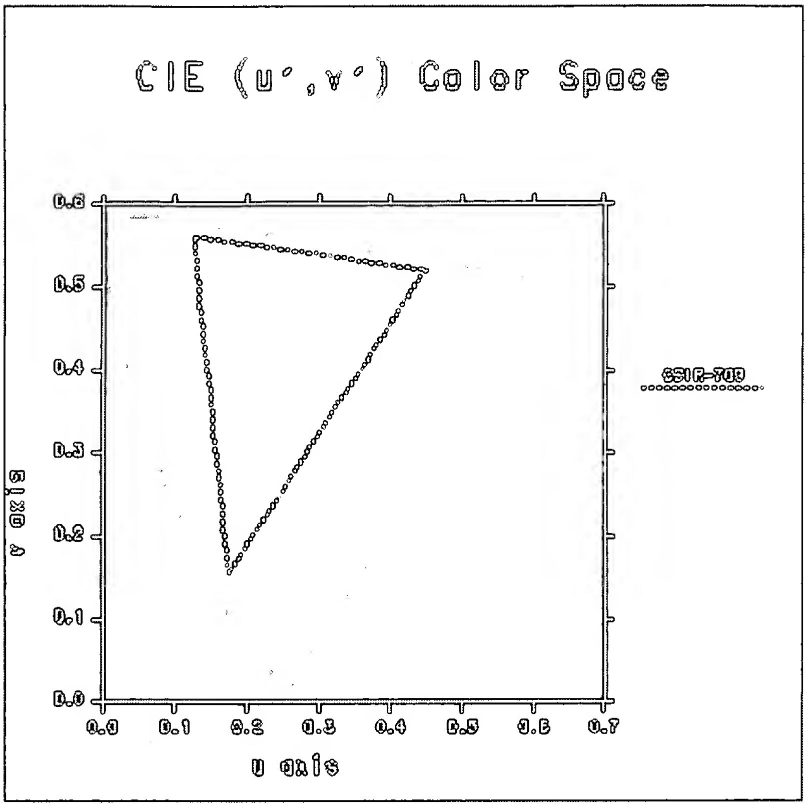
$X = x/y * Y$
$Z = (1-x-y)/y * Y$

To get (x,y) from XYZ:

$x = X/(X+Y+Z)$
$y = Y/(X+Y+Z)$

Comparison to RGB Color

The chart below shows the visible gamut (red outline) in (u',v') perceptually uniform coordinates. The visible spectrum starts with blue at the bottom of the graph, moving through green in the upper left and out to red in the upper right. The smaller interior triangle shows the gamut coverage of typical computer graphics CRT monitors, which is (not by coincidence) the commonly used standard for stored RGB coordinates. The bottom vertex is the blue primary, green at the upper left and red at the upper right.



This graph shows clearly that standard color encodings cover only about half of the visible gamut of colors. If future display systems should be able to reproduce this information, it will unavailable from most RGB storage formats. Even existing display systems, since they do not all use the same primary colorants, have significantly varying gamuts, and any restriction on the stored data restricts the reproduction accuracy.

Even if the monitor exactly matches the gamut of the stored values, taking colors outside the gamut to ones that fit within it (called gamut-mapping) can result in substantial image degradation. By storing the correct original values, gamut mapping can be carried out later as better or more customized algorithms for it are developed.